ResMed

English

HumidAire 2i™
User Manual

English

Contents

Introduction 5
- Definitions 5
- User/Owner Responsibility 5

Medical Information 6
- Intended Use 6
- Contraindications 6
- Warnings and Cautions 6

The HumidAire 2i 8
- HumidAire 2i Components 8

Preparing For Use 9
- Setting Up the HumidAire 2i 9

Operating Instructions 13
- Starting Treatment 13
- Stopping Treatment 15
- Helpful Hints 16

Cleaning and Maintenance 17
- Servicing 21

Troubleshooting 22

Technical Specifications 24
- Humidifier Performance 25

Limited Warranty 27

Introduction

The ResMed HumidAire 2i™ is designed to humidify the air delivered to the airway during continuous positive airway pressure (CPAP), automatic positive airway pressure (APAP), and bilevel therapy. Nasal congestion or dryness of the nose, mouth or throat may be experienced during therapy. These symptoms are caused by dry climates, cold air temperatures, the airflow delivered from the CPAP, APAP, or bilevel system and mouth leak. Moist air helps relieve symptoms of dryness and can make therapy more comfortable. The HumidAire 2i is designed to form a single heated humidification unit when attached to a CPAP, APAP, or bilevel unit.

Definitions

This manual contains special terms and icons that appear in the margins to draw your attention to specific and important information.

WARNING
Alerts you to possible injury.

CAUTION
Explains special measures for the safe and effective use of the device.

Note: *Is an informative or helpful note.*

User/Owner Responsibility

The user or owner of this system shall have sole responsibility and liability for any injury to persons or damage to property resulting from:

- operation which is not in accordance with the operating instructions supplied
- maintenance or modifications carried out unless in accordance with authorised instructions and by authorised persons.

Please read this manual carefully before use.

Medical Information

Intended Use

The HumidAire 2i is indicated for the humidification of the air delivered from a ResMed compatible CPAP therapy device. Refer to the relevant device manual for information regarding its compatibility with the HumidAire 2i.

The HumidAire 2i is intended for single patient re-use in the home environment and multi-patient re-use in a hospital/institutional environment. Contact your equipment supplier or ResMed office if you require further information.

The HumidAire 2i is for use only as recommended by a physician.

CAUTION (USA ONLY)

Federal law restricts this device to sale by or on the order of a physician.

Contraindications

The HumidAire 2i is contraindicated for use with patients whose supraglottic airways have been bypassed. Please also refer to the relevant system manual for contraindications associated with CPAP, APAP, and bilevel therapy.

Warnings and Cautions

The following are general warnings and cautions. Specific warnings and cautions appear next to the relevant instructions in the manual.

WARNINGS

- Use the HumidAire 2i only for its intended use as described in this manual.
- The HumidAire 2i is designed only for use with specific ResMed CPAP, APAP, or bilevel devices. Do not use the HumidAire 2i with any other devices.
- The HumidAire 2i should only be used with delivery tubes or accessories specified in this manual. Connection of other delivery tubes or accessories could result in injury, or damage to the device.
- The HumidAire 2i tubing is for single-patient use and must not be re-used on another person. This is to avoid the risk of cross-infection.
- Always place the HumidAire 2i device lower than the level of the patient. If it is placed at or above the level of the patient, heated water may flow down the air tubing and into the mask.
- Do not attempt to dismantle the HumidAire 2i docking station. There are no user-serviceable parts inside. Repairs and internal servicing should only be performed by an authorised service agent.
- Take care when handling the HumidAire 2i. The water in the water chamber may be hot.
- If liquids are inadvertently spilled on the HumidAire 2i docking station, unplug the CPAP, APAP, or bilevel device from the power outlet and allow the docking station to drain and dry before using.

- The water chamber should not be connected to the docking station when transporting the HumidAire 2i in the carry bag. Place the water chamber in a separate compartment in the carry bag.
- Make sure that the water chamber is empty and thoroughly dried before transporting the HumidAire 2i.
- Do not operate the HumidAire 2i if the CPAP, APAP, or bilevel device has a damaged power cord or plug.
- There exists the possibility that if the device is placed above the level of the patient and is tipped over, or if the tubing is filled with condensate, the mask might fill with water. The HumidAire 2i should therefore be used with caution in patients who are unable to guard their airway, or are unable to pull the mask off, for example following a stroke. Attention should be given to the relative risks and benefits.
- Do not operate the HumidAire 2i if it is not working properly or if any part of it has been dropped or damaged.
- Keep the power cord away from heated surfaces.
- Do not drop or insert any object into any opening or tubes.
- Do not use the HumidAire 2i in the presence of flammable or explosive materials.

The HumidAire 2i

HumidAire 2i Components

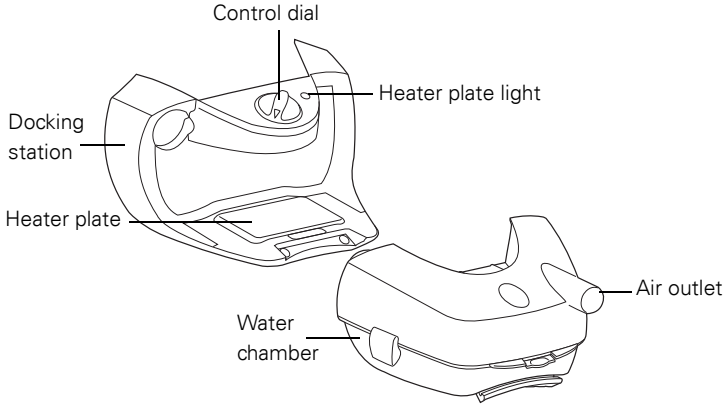


Figure 1: Components of the HumidAire 2i

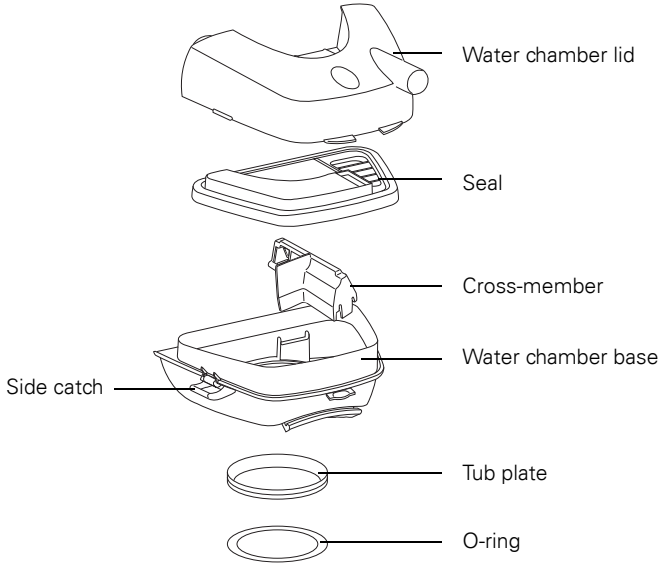


Figure 2: Water chamber components

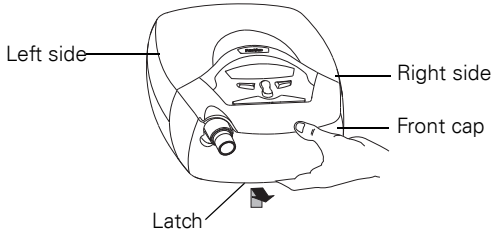
Preparing For Use

Setting Up the HumidAire 2i

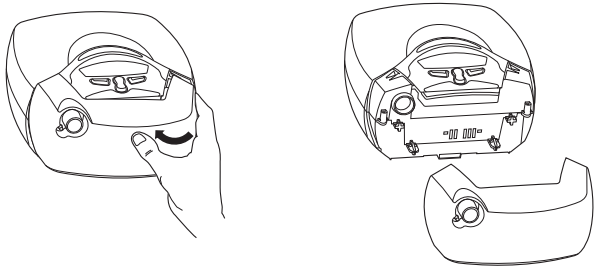
WARNING
Make sure that the CPAP, APAP, or bilevel device is switched off at the power outlet before connecting the HumidAire 2i.

1 Remove the front cap from the device. To do this:

1. Press the latch underneath the front cap.
2. While pressing the latch, lift and pull the front cap away from the device. The front cap should detach from the bottom and right side. The front cap should still be attached to the left side.



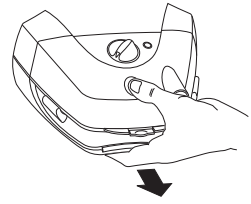
3. Hold the device down with your left hand. With your right hand, firmly pull the right side of the front cap out and then up until the whole front cap comes off.



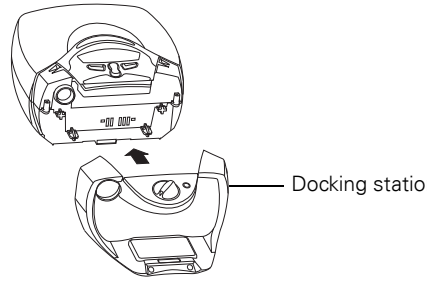
Notes

- To *replace the front cap:*
  a. *Align the air outlet connector inside the front cap to the air outlet on the device.*
  b. *Push the front cap firmly onto the device until it clicks into place.*
- *Remember to take the front cap with you when travelling, in case you need to use your CPAP, APAP, or bilevel device without a humidifier.*

2 Separate the HumidAire 2i water chamber from the docking station. To do this, lift the latch at the bottom of the water chamber and pull the water chamber away from the docking station.



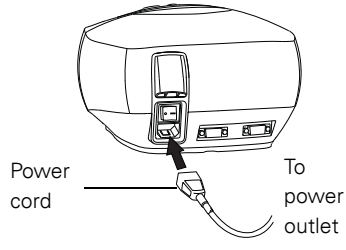
3 Slide the humidifier docking station (with the water chamber detached) onto the device until it clicks into place.



Notes

- *The images in this manual are for illustrative purposes only and may look different from your model.*
- *Under normal operation, there is no need to remove the HumidAire 2i docking station once it is attached to the CPAP, APAP, or bilevel device. If you need to remove it, press the latch underneath the docking station and pull it away from the device.*
- *When removing the docking station, ensure that the water chamber is removed first.*

4 Insert the power cord into the socket at the rear of the device. Plug the other end of the power cord into a power outlet.



WARNING

- Make sure that the CPAP, APAP, or bilevel device is switched off at the power outlet before connecting the HumidAire 2i.
- Make sure the power cord and plug are in good condition and the equipment is not damaged.

5 Place the device on a firm, flat surface near your bed. Make sure that it is placed at a level lower than your sleeping position so that any excess condensation drains back into the water chamber.

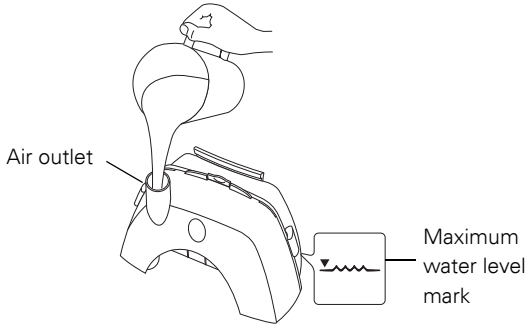
CAUTION

Be careful not to place the device where it can be bumped into and knocked over.

WARNING

Do not fill the water chamber while it is attached to the docking station and the CPAP, APAP or bilevel device.

6 Turn the water chamber so that the air outlet points up. Over a sink, carefully fill the water chamber through the air outlet up to the maximum water level mark shown on the side of the water chamber base.



The HumidAire 2i should be filled with fresh water before use. Always ensure that the water chamber is clean. See "Cleaning and Maintenance" on page 13.

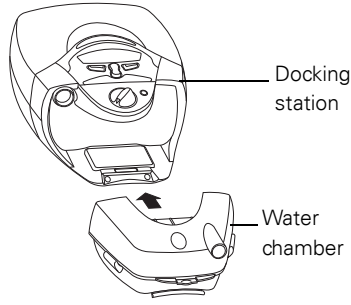
WARNING

Do not overfill the water chamber, as water may enter the CPAP, APAP, or bilevel device and air tubing.

CAUTION

Do not use additives, in particular aromatic additives (eg, scented oils and perfumes). They may reduce the humidification output of the device and/or cause deterioration of the water chamber materials.

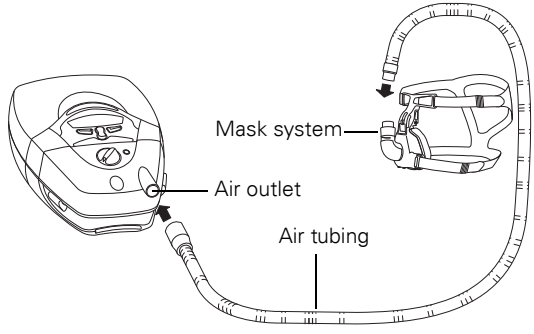
7 Carefully, slide and push the filled water chamber onto the humidifier docking station (already attached to the CPAP, APAP, or bilevel device) until it clicks down into place. Ensure that the water chamber is fully engaged.



WARNING

- Always connect the HumidAire 2i docking station before connecting the water chamber.
- To prevent water from entering the CPAP, APAP, or bilevel device, only move or transport it with the HumidAire 2i attached if the water chamber is empty and thoroughly dry.

8 Connect one end of the air tubing firmly onto the air outlet on the water chamber and the other end to the mask system.



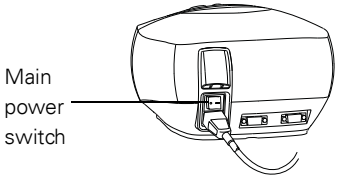
The HumidAire 2i is now ready for use. To start treatment, see "Operating Instructions" on page 9.

Operating Instructions

Starting Treatment

The HumidAire 2i should be filled with fresh water and attached to the CPAP, APAP, or bilevel device, with the air tubing and mask system connected. See "Setting Up the HumidAire 2i" on page 5.

1 Switch on the power at the power outlet. Switch the main power switch at the back of the device ON.



When the device is turned on a prompt for the Warm-Up feature will appear (not available on all models).

The Warm-Up Feature is automatically displayed when the HumidAire 2i is connected to the CPAP, APAP, or bilevel device. When activated, this feature allows the water to warm up before you start treatment.

Note: *The device automatically detects the presence or absence of the HumidAire 2i. There is no need to enter the menus to change the humidifier setting.*

2 Pre-heat the water before starting treatment by activating the Warm-Up Feature. Skip this step if you do not wish to use the Warm-Up feature.

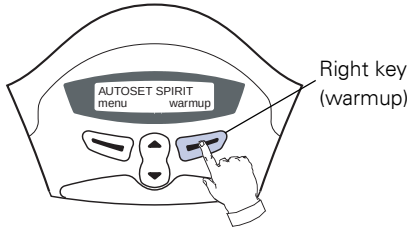
Warm-Up Feature (not available in all models)

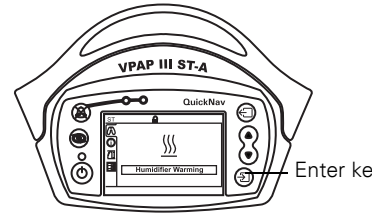
The Warm-Up feature allows you to pre-heat the water in the humidifier prior to starting treatment. The result is that the air is comfortably humidified at the start of treatment.

You can begin using the device at any time during the humidifier 'Warm-Up' period. The 'Warm-Up' feature will automatically turn off after 30 minutes if treatment has not started.

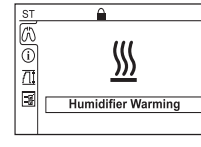
To activate the Warm-Up Feature:

1. Depending on your model, press the **Right** (warmup) key or the **Enter** key on the control panel.





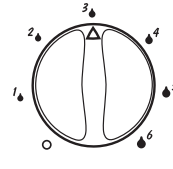
2. The Warming screen (which may vary in appearance according to your model) will be displayed to indicate that the Warm-Up feature is activated.



3. While the HumidAire 2i is in Warm-Up mode you can:
   - Start treatment at any time by pressing the **Front** or the **Enter** key (depending on your model).
   - Access the menus by pressing the **Left** (menu) key. For the VPAP™ III ST-A with QuickNav™, use the **Up/Down** and **Enter** keys to access the menus.
   - Stop the Warm-Up feature at any time by pressing the **Right** (exit) key (this does not apply to the VPAP III ST-A with QuickNav).

3 Turn the humidity control dial to the desired setting. The control dial is labelled as shown in the diagram below. A setting of 1 provides minimum humidification, and a setting of 6 delivers maximum humidification. The setting marked with a O switches heated humidification off.

Initially, set the control dial to 3. If necessary adjust the control dial up or down to find the most comfortable and effective setting. You can adjust the humidity setting at any time.



Your aim is to have moist air delivered at your mask while avoiding condensation in the air tubing. Your ideal setting will depend on the temperature and humidity of the surrounding air.

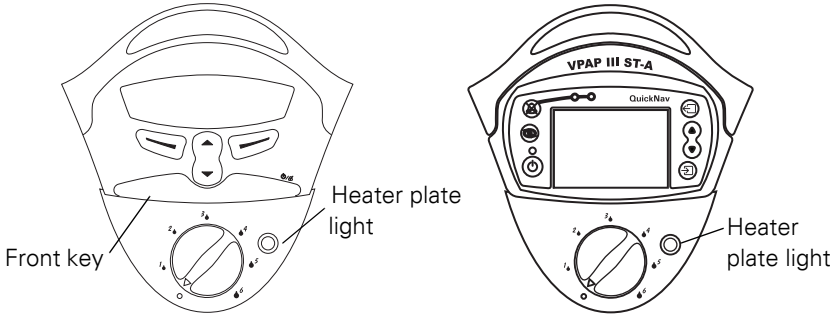
See “Helpful Hints” on page 12 for further tips on the correct humidity setting.

4 Fit your mask as described in the mask user instructions.

WARNING

Before starting therapy ensure that you are wearing the mask and that the mask and air tubing are fitted correctly.

5 Press the **Front** key or the **Enter** key (depending on your model) on the control panel. Alternately, if the SmartStart function is enabled, simply breathe into the mask. Air should begin to flow from the device.



Note: *During operation, the heater plate light illuminates periodically to indicate that the heating element is active. The HumidAire 2i has a rapid heating element which allows very short heating times. Do not be concerned if the light only flashes on very briefly.*

6 Lie down and arrange the air tubing so that it is free to move if you turn in your sleep.

WARNING

Do not leave long lengths of air tubing around the top of your bed. It could twist around your head or neck while you are sleeping.

Stopping Treatment

To stop treatment at any time, remove your mask and press the **Front** or the **Enter** key (depending on your model). Alternately, if the SmartStart function is enabled, simply remove your mask and treatment will end.

You may notice that the device continues to blow air gently after you have pressed the **Front** or the **Enter** key (depending on your model). This continues for up to one hour to assist cooling of the heater plate. However, you can switch off the power at any time and allow the heater plate to cool without airflow.

Helpful Hints

Condensation in the Mask or Air Tubing

You may experience excessive condensation in the mask or air tubing. This may occur seasonally, particularly when the weather is cool. Turn the humidity control dial down until the condensation decreases.

Another cause of condensation is air blowing directly on the air tubing, for example from fans and air conditioning units. This causes the humidified air to quickly lose temperature, resulting in increased condensation. Avoid this situation when possible. Placing the air tubing under the bed covers with you may help prevent condensation.

We recommend that you arrange the device so that any excess condensation drains back into the water chamber.

Symptoms of Dryness Still Present

If you still experience symptoms of dryness, then your humidity setting may be set too low to be effective. Gradually turn the humidity control dial up over a few nights until the symptoms disappear.

If you are still experiencing symptoms of dryness, even after increasing the humidity setting, you may be breathing through your mouth. Mouth breathing or mouth leaks cause drying and irritation of the upper airway. If this is a problem, a full face mask or chin strap may help. Consult your clinician or equipment supplier for details.

Nasal Infection or Illness

If you have a cold or nasal infection, be sure to clean the HumidAire 2i thoroughly each day. Do not put aromatic oils or decongestants into the water chamber.

CAUTION

Do not use additives, in particular aromatic additives (eg, scented oils and perfumes). They may reduce the humidification output of the device and/or cause deterioration of the water chamber materials.

Scaly Mineral Deposits

You may notice a white powder or deposits in the water chamber base. These are mineral deposits from the tap water. To remove these deposits, rub the water chamber base gently using a mild washing detergent.

To prevent these deposits forming, fill the water chamber with demineralised water.

Seasonal Changes

You may have to adjust your humidity setting from season to season, or if you travel to a different climate.

Cleaning and Maintenance

You should regularly carry out the cleaning and maintenance described in this section.

Cleaning the HumidAire 2i between patients

The HumidAire 2i should be disinfected when used between patients. Detailed disinfection instructions are available from the ResMed website www.resmed.com and must be consulted before re-use.

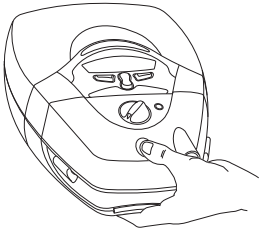
Note: *The HumidAire 2i is available in both a clear polycarbonate (PC) version as well as a smoky gray polysulphone (UDEL) version. Only the clear polycarbonate (PC) version is able to be disinfected.*

Cleaning the HumidAire 2i for home users

WARNING

Beware of electrocution. Do not immerse the device or power cord in water. Always unplug the device before cleaning and be sure that it is dry before plugging back in.

1. Turn the main power switch at the back of the device to OFF, and unplug the power cord from the power outlet.
2. Allow 10 minutes for the heater plate and any excess water to cool.
3. Remove the water chamber. To do this, lift the latch at the bottom of the water chamber and pull the water chamber away from the docking station.



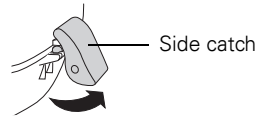
WARNING

- Take care when handling the HumidAire 2i. The water in the water chamber may be hot.
- Do not touch the tub plate at the base of the water chamber while removing the water chamber from the docking station. It may be hot.

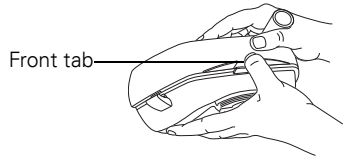
4. Discard any excess water by turning the water chamber upside down, allowing the water to drain out of the air outlet.

5 Disassembling the Water Chamber

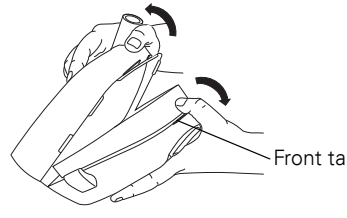
1. To open the side catches pull out from the lower edge.



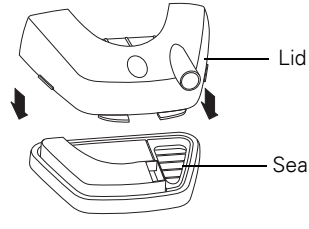
2. Hold the water chamber as shown below:



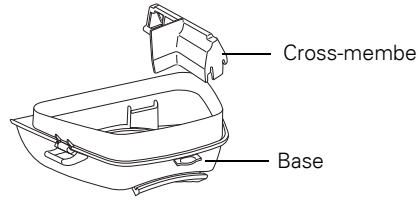
3. Separate the water chamber by pulling the two halves apart. Use your thumb to pull down on the front tab.



4. Remove the seal by peeling it away from the inside of the lid.



5. Remove the cross-member from the water chamber base.

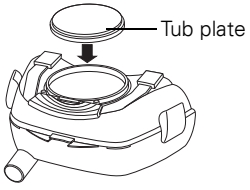


6 Discard any remaining water.

The tub plate does not need to be removed from the water chamber base. If removed, replace the tub plate by:

1. Turning the water chamber base upside down.

2. As shown below, position the tub plate so that the open side is facing down. Then firmly press the tub plate down into the water chamber.



Note: *The tub plate will not fit into the water chamber if it is facing up. Before fitting the tub plate, make sure the O-ring is fitted snugly inside the groove of the tub plate.*

7 Cleaning

Water Chamber

Wash the lid, seal, cross-member and base in warm water using a mild detergent or in a dishwasher. Rinse them thoroughly with clean water and allow them to dry away from direct sunlight. Do this daily or after each use. Inspect the water chamber for wear and deterioration. Replace any damaged parts.

CAUTION

Do not use any of the following to clean any part of the HumidAire 2i. These solutions may cause damage and reduce the life of the product.

- bleach, chlorine-, alcohol-, or ammonia based solutions
- moisturizing, antibacterial, or glycerine based soaps
- water softening and descaling agents

If using a dishwasher, avoid heavy duty or high temperature cycles (greater than 158°F). Do not use strongly alkaline detergents and rinse aids.

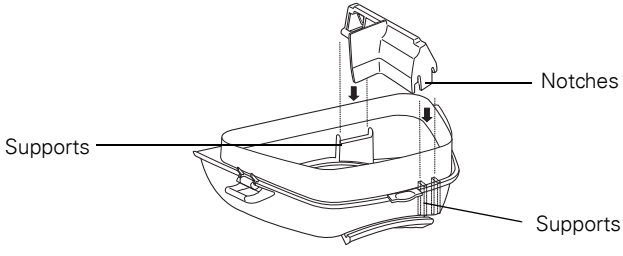
Docking Station

Wipe the outside of the docking station with a damp cloth. Do this periodically.

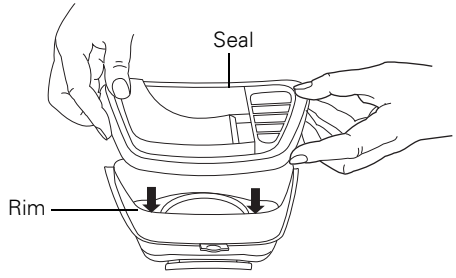
8 Reassembling the Water Chamber

When all the water chamber parts are clean and dry, reassemble the water chamber:

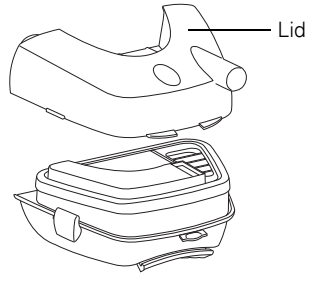
1. Place the cross-member on its supports inside the water chamber base.



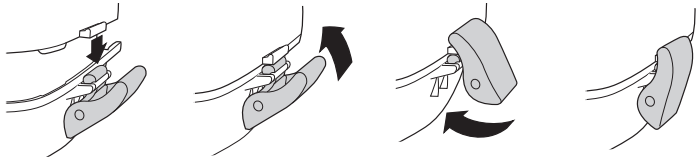
2. Fit the seal onto the rim of the water chamber base. Press along the edge to ensure that the seal is fitted properly.



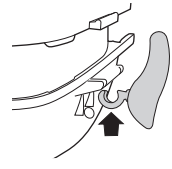
3. Fit the lid onto the water chamber base. Press the lid and base firmly together to close.



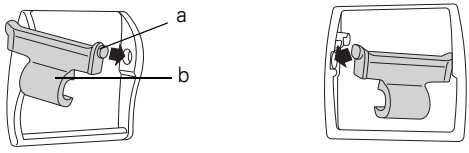
4. To close the side catches see the illustrations below,



Note: *If the side catches become detached from the water chamber base, reattach them as shown.*



The side catches consist of two parts. If they become separated clip them back together as shown. Insert the smaller end (a) of the hinge (b) first, hold it flat, and press firmly into place.



Servicing

This product (HumidAire 2i) should be inspected by an authorized ResMed Service Center 5 years from the date of manufacture. Prior to this, the device is intended to provide safe and reliable operation provided that it is operated and maintained in accordance with the instructions provided by ResMed. Applicable ResMed warranty details are provided with the device at the time of original supply. Of course, as with all electrical devices, if any irregularity becomes apparent, you should exercise caution and have the device inspected by an Authorized ResMed Service Center.

Troubleshooting

If there is a problem, try the following suggestions. If the problem cannot be solved, contact your equipment supplier or ResMed. Do not attempt to open the unit.

WARNING
Service and repair should only be performed by an authorised service agent. Under no circumstances should you attempt to service or repair the unit yourself.

Problem	Possible Cause	Solution
Device not working (no display on LCD screen)	Power cord is not plugged in properly.	Check that the power cord is plugged firmly into the power outlet.
	Device not switched on.	Check that the switch at the back of the device is in the ON position.
	Faulty power outlet.	Try another power outlet.
Heater plate light not lighting up	The Front key on the device has not been pressed.	Press the Front key on the device to activate the heater plate.
	Control dial is in the OFF position.	Turn the control dial up from the OFF position.
Leaking water chamber	The water chamber may be damaged or cracked.	Contact your supplier for a replacement.
	The lid may not be on correctly.	Press the lid down firmly.
	Water chamber seal may be twisted.	Make sure the seal is seated properly inside the water chamber.
	Side catches are not engaged properly.	Make sure the two side catches are engaged properly.
	The tub plate is incorrectly fitted.	Make sure the tub plate is fitted correctly.

Problem	Possible Cause	Solution
No air flow	The air tubing is not connected properly.	Connect the air tubing as described in "Preparing For Use" on page 5.
	The air tubing is blocked, pinched or punctured.	Unblock or free the air tubing. Check the air tubing for punctures.
	The CPAP, APAP, or bilevel device is not working correctly.	See the Troubleshooting section in the CPAP, APAP, or bilevel device manual.
	The water chamber is overfilled.	Empty some water from the water chamber. Make sure that the water level is not above the maximum water level mark.
Water splashing on your face	The water chamber is overfilled.	Empty some water from the water chamber.
	The control dial is set too high and condensation is forming in the air tube and mask.	Turn the control dial down.
	Air blowing on the air tubing (from fans and air conditioning units) is causing condensation.	Insulate the air tubing. Placing the air tubing under the bed covers may help prevent condensation.
Air does not feel moist	The control dial is set too low.	Turn the control dial up.
	HumidAire 2i heating element is not working.	Contact your equipment supplier.
Air too moist	Control dial is set too high.	Turn the control dial down.
	High ambient relative humidity.	Adjust your humidity setting.

Technical Specifications

Performance
Maximum heater plate temperature: 167°F

Temperature cut-out: 199°F

Maximum output humidity: 95% relative humidity (control dial set to maximum setting, flow rate 50 L/min, ambient temperature of 68°F, ambient relative humidity of 40%).

Dimensions (H x W x D)
4.8 in x 7.2 in x 8.6 in (docking station and water chamber)

Weight
2 lb (docking station and unfilled water chamber)

Water Capacity
To maximum fill line: 400 mL

Power Supply
Input range for AutoSet Spirit Unit with HumidAire 2i: 100–240 V, 50–60 Hz, <528 VA (maximum power consumption)

Actual power consumption will vary, depending on factors such as temperature setting, set pressure, the use of accessories, height above sea level and ambient temperature.

Housing Construction
Docking station: Flame retardant engineering thermoplastic

Water chamber: Injection molded plastic

Environmental conditions
Operating temperature: +41°F to +104°F
Operating humidity: 10–95% non-condensing
Storage and transport temperature: -4°F to +140°F
Storage and transport humidity: 10–95% non-condensing

IEC 60601-1 Classification
Class II (double insulation)

Type CF

Electromagnetic Compatibility
Product complies with all applicable electromagnetic compatibility requirements (EMC) according to IEC60601-1-2, for residential, commercial and light industry environments.

Humidifier Performance

The following settings have been tested at 23°C, 40% RH ambient conditions:

CPAP Mask Pressure cm H_2O	RH Output % Setting 6	Nominal System Output AH[1], BTPS[2] Setting 6
4	>95	18
10	>95	14
15	>95	13
20	>95	12
25	>95	12

1. AH- Absolute Humidity in mg/L.
2. BTPS- Body Temperature Pressure Saturated.

Note: *The manufacturer reserves the right to change these specifications without notice.*

Symbols Which Appear on the Device

Attention, consult accompanying documents

Type CF applied part

Class II equipment

Drip Proof

Hot Surface

Do not touch

Maximum water level

Limited Warranty

ResMed warrants that your ResMed product shall be free from defects in material and workmanship for the period specified below from the date of purchase by the initial consumer. This warranty is not transferable.

Product	Warranty Period
ResMed humidifiers, ResControl™, ResLink™, ResTraxx™	1 Year
ResMed flow generators	2 Years
Accessories, mask systems (including mask frame, cushion, headgear and tubing). Excludes single-use devices.	90 Days

Note: *Some models are not available in all regions.*

If the product fails under conditions of normal use, ResMed will repair or replace, at its option, the defective product or any of its components. This Limited Warranty does not cover:

a) any damage caused as a result of improper use, abuse, modification or alteration of the product;

b) repairs carried out by any service organization that has not been expressly authorized by ResMed to perform such repairs;

c) any damage or contamination due to cigarette, pipe, cigar or other smoke;

d) any damage caused by water being spilled on or into a flow generator.

Warranty is void on product sold, or resold, outside the region of original purchase. Warranty claims on defective product must be made by the initial consumer at the point of purchase.

This warranty is in lieu of all other express or implied warranties, including any implied warranty of merchantability or fitness for a particular purpose. Some regions or states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

ResMed shall not be responsible for any incidental or consequential damages claimed to have occurred as a result of the sale, installation or use of any ResMed product. Some regions or states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from region to region.

For further information on your warranty rights, contact your local ResMed dealer or ResMed office.

R001-307/2 05 06